

## **Physics 422 Laboratory-1917**

**Jon Scott Bender, a UT graduate, was attending an estate sale in Dallas, Texas when he spied a UT Physics Laboratory Manual for Physics 422 and a number of associated lab reports. While not a physics major, Jon's appreciation of history and loyalty to his alma mater motivated him to buy the documents. He found this physics history web site contacted me, and offer to give these items to the department. I very much appreciate his thoughtfulness.**

**The manual and portions of the lab reports are included below. The story of the individuals associated with the documents is quite interesting, inspiring and tragic.**

**The course Physics 422 was an upper division course entitled, "Magnetism, Electricity, Light and Sound." The lecture met for three hours each week and the laboratory also was a three hour session. Prerequisites: Mathematics 1 (This was an applied mathematics course for engineering students, there was also a Department of Pure Mathematics at this time.) *Physics 1-General Physics* or *Physics 38-Mechanics and Heat*. Lecture was in K. Hall and laboratory was in the Main Building. It must have been a popular course since in 1921 eight sections were listed.**

**As one can see from the manual, the experiments were all classical physics and quite demanding.**

**The instructors included Professor S. Leroy Brown, Preston Hampton Edwards and James Newton Michie.**

Exercise No. 8 Section No. \_\_\_\_\_  
Table No. \_\_\_\_\_

97

THE UNIVERSITY OF TEXAS

SCHOOL OF PHYSICS

Reported by Maud Barnes Performed with Roxie Clark

Title An experiment to measure the magnetic flux  
of the pole pieces of a motor.

Assigned Feb. 15, 1917 Reported Mar. 1, 1917

THE FOLLOWING BLANKS ARE NOT TO BE FILLED IN BY THE STUDENT

Returned for Correction \_\_\_\_\_

Received Corrected \_\_\_\_\_

Accepted \_\_\_\_\_

The lab reports below were written by Maud Barnes and Roxie Clark. Both were student assistants in the Department of Chemistry. Roxie, a graduate student, was receiving a salary of \$350 for 1916-17 school year. Maud, a senior, was earning \$143.62 for the same period.



**Maud Alice Barnes was born in Floresville, Texas, December 17, 1886, (Her Texas death certificate states December 16, 1890, however all census records point to the earlier date.) Her parents were Peter Benjamin and Maud Lela Stroud Barnes. Peter was a photographer. He died in 1909. Maud Alice was a public school teacher in 1910 and living at home. Her mother is not employed. Where she got her early education is not known at this time. She later enrolled in the University of Texas. She would have graduated**

in 1917. However an attack of appendicitis on April 8, 1817, led to her death nine days later on April 17. Professor E. P. Schoch accompanied her body back to Floresville for burial. A resolution appeared in *The Daily Texas* from the senior class, "In view of the recent death of our beloved classmate and friend Maud Barnes, we, the members of the Senior Class hereby express our deep regret at the loss of so prominent a member, one whose influence counted so strongly for good in the life of the University at large. We hereby resolve that our deep and heartfelt sympathy be extended to the members of Miss Barnes family, and that a copy of these resolutions be sent to the by the secretary of the class. She was to graduate that year. Maud was quite active in a number of campus organizations: Chemical Club; Cap and Gown; YWCA; DAR; Pierian Literary Society, President '15-16; General Science Club, Chairman '16-17; Student Assistant in Chemistry '14-17. In May 1916, Maud founded the General Science Club, the purpose, "To promote the spirit of scientific research among women.

Maud's lab partner was Roxane "Roxie" Clark. Roxie Clark was born in Conway, Arkansas, September 8, 1888. Her parents were James Clay and Frances Caroline Clark. She attended Hendrix College in Conway, studying chemistry and physics. She graduated in 1909. In 1918, she earned a Masters in chemistry with a thesis entitled, "Studies in the Scale of Combined Influence of Position, Substitution, and Linkage of Some Organic Compounds."

**WILLIAM THORNTON READ**

Born March 8, 1896, at College Station, Texas.  
Home Address, College Station, Texas. In Col-  
lege one year. Boylston Chemical Club.



Roxie married William Thornton Read, a U. Texas chemistry graduate student, September 9, 1918. William earned A.B.1905 and A.M. 1908 from Austin College. He received an M.A. in 1915 from UT. He earned a Ph.D. from Yale in 1921. While at Yale Roxie work in a private laboratory. They had two children, Dr. William T. Read Jr. (1921-98) and Dr. Roxana Clark Read Wiswell (1925-83).

William Jr., BS Rutgers '44, MS, Brown '48, was an important physicist who served in WWII. He is pictured on left below. [\(From a picture in the Katharine Anne Read Hughes collection.\)](#) His father, right end, and father's cousin, Rev J. Leighton Read, in center, are in the photo. Middle person is cousin of his. His thesis was entitled, "An application of the Prager-Synge approximate method in elasticity." He was one of the discoverers of a theory for dislocations in crystals.



Here is an excerpt from a book, *The Coming of Materials Science* by R. W. Cahn, 2001. "One of the big problems initially was to understand how the relatively few dislocations that are grown into crystals can multiply during plastic deformation, increasing their concentration by a factor of more than thousand fold. The accepted answer today is the Frank-Read source, of which Figure 3.14 is a specimen. The segment of dislocation line between two powerful pinning points (constituted by other dislocations skew to the plane of the source) moves rapidly under stress. emits a complete dislocation ring and returns to its initial geometry to start over again. Charles Frank (1911-1998) has recorded in brief and pithy form how this configuration acquired its name (Frank 1980). He and his co-originator, Thornton Read (W.T. Read, J12), who worked at Bell Laboratories. in 1950 were introduced to each other in a hotel in Pittsburgh, just after Frank had given a lecture at Cornell University and conceived the source configuration. Frank was told at the hotel that Read had something to tell him; it was exactly the same idea. On checking, they found that they had their brainwaves within an hour of each other two days previously. So their host remarked: "There is only one solution to that, you must write a joint paper", which is what they did (Frank and Read 1950). Coincidence rarely comes more coincident than this!" A further comment on Read's work is taken from a paper by Patel and Kimerling, *Crystal Research and Technology*, 1981, "Nearly 25 years

ago Thornton Read in a series of elegant papers worked out a theory of the electrical behavior of dislocations in semiconductors based on the dangling bond model of a dislocation in the diamond lattice proposed by Shockley. The theory considered the statistics of occupation of dislocation acceptor sites taking into account interactions between neighboring charged sites. With modifications Read's ideas have dominated much of the subsequent theoretical work in this field." Read's book, *Dislocations in Crystals*, 1953 is considered a classic. He dedicated the book to Mildred H. Read, presumably his wife. Read worked at Bell Labs and Brown U. Freeman Dyson, said that the Bell Labs report that Read wrote in 1960 on "Strategy for Active Defense" had a decisive effect on his thinking about missile defense. Read Jr.'s sister, Dr. Roxana Read Wiswell, was a physician in Harper, TX. She tragically died in an auto accident. (Wiswell, Roxana Read Dr., 31-Jan-1983, Denton, TX.)

William Sr. was an instructor at Yale for a number of years. In 1925, he was lured away from Yale to be Head of the chemistry department at the newly created Texas Tech University. While there the university president determined that Read needed more help with his duties. Here is an excerpt from *An Early History of Chemistry at Texas Tech University, 1925-1970, Bull. Hist. Chemistry Vol 29, No. 1 (2004)*, "The only other appointments to help Read in his work were of Hulda Wilde Marshall and Roxie Clark Read in 1926, and of William Mackey Slagle in 1928. Roxie Clark Read was Read's wife, who had an M. A. degree (1918) in chemistry from UT. Her appointment at TTC was negotiated by Horn in order to avoid the criterion of nepotism that prevented Read himself from hiring his wife. Horn arranged for the appointment to be made directly by the Board of Directors. One wonders, though, how, in 1926, Ruth B. Studhalter remained an instructor in biology while her husband, Richard A. Studhalter, was listed as Head of Biology; that appointment has yet to be researched." In 1930, William became the Dean of the School of Chemistry at Rutgers University. In 1943, he went into government service with chemical problems in the War Production Board. He then organized the National Roster of Scientific Personnel for the use of the armed forces in production.

**He also served as head of the Scientific Information Section for the Chief of Staff of the U. S. Army.**

**William Sr. died in 1972. Roxie died in Pasadena Texas, March 30, 1975.**